A.T. Kearney, Inc.
225 Reinekers Lane
P.O. Box 1405
Alexandria, Virginia 22313
703 836 6210
Facsimile 703 836 0547

Management
Consultants

ATKEARNEY

February 24, 1989

Ms. Shirley Bulkin
Regional Project Officer
U.S. Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, PA 19107

Reference: EPA Contract No. 68-01-7038; Work Assignment No. R03-12-01; Air Products and Chemicals, Inc., Elkton, MD; EPA ID No. MDD003067832; RFA Report

Dear Ms. Bulkin:

Enclosed please find the RCRA Facility Assessment report for the subject facility. This letter summarizes the findings of the RCRA Facility Assessment (RFA) conducted at the subject facility by CDM Federal Programs Corporation. This letter also discusses the recommendations and conclusions from the RFA.

The Air Products and Chemical, Inc. facility manufactures polyvinyl acetate emulsions. The emulsions are used by other companies to manufacture adhesives, paints, paper coatings, textiles, and non-woven products. The primary wastes generated at the facility are a hazardous caustic methanol cleaning solution and non-hazardous wastewaters. Small quantities of hazardous laboratory wastes and waste oil also are generated.

Five solid waste management units (SWMUs) have been identified at the facility. Of the five SWMUs, two are used in the management of hazardous wastes. These SWMUs are described below.

Unit No. 1. - Caustic Methanol Storage Unit - consists of a diked area containing two above-ground tanks which store the caustic methanol cleaning solution, two above-ground tanks storing raw materials, and two above-ground tanks storing finished product.

Unit No. 2. - Concrete Storage Pad - is used to store drums of hazardous laboratory wastes and empty drums.

Unit No. 3. - Waste Oil Storage Area - consists of a diked area containing three above-ground tanks. One of these tanks is used to hold waste oil.

Unit No. 4. - Wastewater Treatment Unit - pretreats the industrial wastewaters prior to discharge into the sanitary sewer.

Unit No. 5. - Laboratory Satellite Collection Area - a paved area which is used to store a drum containing laboratory wastes.

Data obtained during the RFA identified current practices used to control pollution migration and exposure potentials. However, several potential sources of contamination were identified. These include:

- Untreated wastewaters were discharged into surface waters prior to July 1988.

- Six underground storage tanks in use at the facility are 25 to 34 years old. Because only one has been tested for integrity, it was not possible to determine if the tanks are leaking.

- During the visual site inspection (VSI), a small area of discolored soil was observed adjacent to an above-ground diesel oil storage tank. This diesel oil is used to fuel a vehicle used to move railroad tank cars. Plant personnel reported that the area of discoloration was due to leaks either from the vehicle or from spills during refueling. Plant personnel reported that this discolored soil was cleaned up immediately after the VSI.

- The reactor vessels, used in the production process, vent small amounts of vinyl acetate to the atmosphere. Air monitoring instruments did not detect any organic vapors outside the production building during the VSI.

In addition, records from the Cecil County Health Department (CCHD) indicate that in August and September of 1971, there were complaints of odors emanating from a pond behind the facility buildings. This problem occurred before Air Products purchased the site from Airco. The CCHD records indicate that the pond contained black-colored water which smelled like sewage. Airco filled in the pond as directed by the CCHD and the case was closed. The odor first appears to have been detected on August 9, 1971. The exact location of the pond is not known, and no sign of a pond, excavation, or stressed vegetation was observed during the VSI. No one at Air Products or CCHD recalls this incident. If the pond contained sewage or similar organics, it has likely degraded over the past 19 years. However, EPA may wish to consider collecting samples to verify this. It may be possible to obtain information on the pond's location using aerial photographs or other sources; however, if the pond was open for only approximately 47 days, it may not be present on any aerial photographs.

Little information was available regarding underground storage tank integrity. We recommend that all underground storage tanks at the facility be tested for structural integrity and leaks.

If you have any questions regarding the information presented or have any additional concerns, please contact me or Emily Duthinh, the Work Assignment Manager, at (703) 968-0900.

Yours truly,

Charles Saunders

for James E. Levin
Technical Director

Enclosure

cc: J. Barnett, EPA Region III
G. Bennsky
D. Bean
K. Allison
E. Duthinh, CDM
W. Koski, CDM
B. Pluta, CDM

2090e

RCRA FACILITY ASSESSMENT
AIR PRODUCTS & CHEMICALS, INC.
ELKTON, MARYLAND

Prepared for:

U.S. Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

Prepared by:

A.T. Kearney, Inc.
225 Reinekers Lane
Alexandria, Virginia 22314

and

CDM Federal Programs Corporation
131 Lee Jackson Highway
Suite 200
Fairfax, Virginia 22033

EPA Contract No. 68-01-7038
Work Assignment No. R03-12-04

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1.0 INTRODUCTION

1.1 Statement of Work

CDM Federal Programs Corporation (CDM FPC) has conducted a Preliminary Review (PR) and a Visual Site Inspection (VSI) of the Air Products and Chemicals, Inc. facility in Elkton, Maryland. This work was performed as part of the RCRA Facility Assessment (RFA) being conducted for the U.S. Environmental Protection Agency (EPA) under EPA Contract No. 68-01-7038, Work Assignment No. R03-12-01. This report documents the findings of the PR and the VSI portions of the RFA.

The PR and the VSI were performed to identify and evaluate past and potential releases to the environment from the solid waste management units (SWMUs) at this facility. The PR focused on the review and evaluation of the documents obtained from the EPA Region III files, the Hazardous and Solid Waste Administration of the Maryland Department of the Environment, and the Cecil County Health Department. The VSI focused on verifying the information in the documents collected during the PR and identifying SWMUs. During the course of the PR and VSI, it was determined that four SWMUs and one area of concern exist at the facility.

The VSI was conducted on December 19, 1988. Present for the VSI were Emily Duthinh and Andrew Oravetz of CDM FPC; John van Hulle and William MacNair of Air Products and Chemicals, Inc.; and William Arguero of the Maryland Hazardous and Solid Waste Administration. The entire Air Products and Chemicals, Inc. facility in Elkton, Maryland was evaluated during the VSI.

1.2 Facility Location

The Air Products and Chemicals, Inc. facility is located at 329 West Main Street in Elkton, Maryland (**Figure 1**). The geographic location is 39° 36′ 15" north latitude and 75° 50′ 30" west longitude. The property consists of less than one acre (Air Products and Chemicals, Inc., November 6, 1980) and is located in the southwestern end of the town of Elkton. The surrounding land use is both commercial and residential.

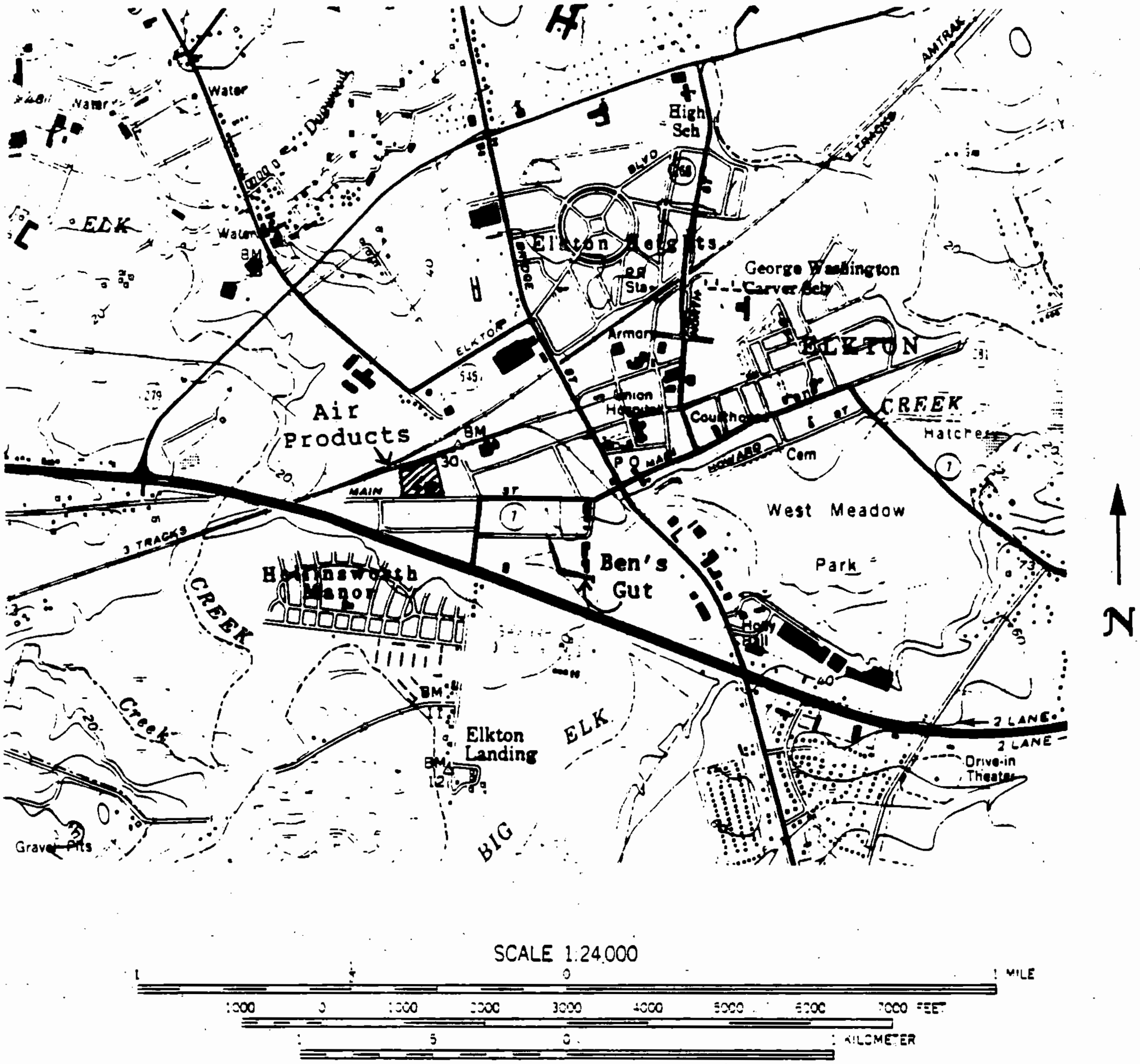

Figure 1. Site Location Map of Air Products and Chemicals, Inc. in Elkton, Maryland (USGS 7 1/2 Minute Map of the Elkton, MD Quadrangle, 1985).

2.0 ENVIRONMENTAL SETTING

2.1 Climate

The Air Products and Chemicals facility is located in the east-central part of Cecil County, Maryland. This area has a humid, continental climate with well defined seasons. The Chesapeake Bay and its tributaries and, to a lesser degree, the Atlantic Ocean have a modifying effect on the climate, especially in modifying extreme temperatures.

The warmest period of the year is the last half of July, when the maximum afternoon temperatures average near 90^oF. Temperatures of 90^oF or higher occur on an average of 34 days per year. The coldest period is the end of January and the beginning of February, when early morning minimum temperatures average near 22^oF. The average number of days the daily minimum temperature is 32^oF or lower is 111.

During the period 1930-60, the average annual precipitation was 45.35 inches, with a low of 26.96 inches in 1930 and a high of 58.01 inches in 1945. The monthly distribution is fairly uniform throughout the year. August generally has slightly more precipitation than the other months.

Prevailing winds are from the west-northwest to northwest. During May through September, they become more southerly. The average annual windspeed is about 9 or 10 miles per hour (Mayer, W.J., National Weather Service, 1973).

2.2 Topography and Land Use

The topography of the area surrounding Air Products and Chemicals is characterized by flat to moderately hilly terrain. The facility itself is located in the town of Elkton, on the floodplain of the Elk River, and the general ground surface of Elkton slopes less than 1% toward the south-southwest. The elevation of the facility is approximately 30 feet above sea level.

The area immediately surrounding the facility is commercial and industrial, but the vicinity includes a wide variety of land uses (i.e., forest, agriculture, pasture, residential and wetland).

The facility is serviced by the City of Elkton municipal water authority and sewage system.

2.3 Soils

The Air Products facility lies on two soil series. The Mattapex silt loam on 0-2% slopes lies on the southern half (approximately 50%) of the Air Products property. The Beltsville silt loam lies on the northern half of the property. The northeast corner (approximately 25%) of the property lies on the Beltsville silt loam with 0-2% slopes. The northwest side (approximately 25%) of the property lies on the Beltsville silt loam with 2-5% slope and moderate erosion (Soil Conservation Service, 1973).

The Mattapex series consists of deep, nearly level to moderately sloping, moderately well drained, loamy soils that formed in silty material laid down on older, coarser sediment. In a representative profile, the surface layer is about 10 inches of greyish-brown silt loam. Below this is a yellowish-brown silt loam subsurface layer about 4 inches thick. The subsoil is about 17 inches of silt loam. It is yellowish-brown in the upper part and dark yellowish-brown in the lower part. This is underlain by a strong-brown silt loam to a depth of 64 inches and a very pale brown, fine sandy clay loam to a depth of 75 inches.

The Beltsville series consists of nearly level to moderately sloping, moderately well drained soils on the Coastal Plain. In a representative profile the surface layer is about 7 inches of yellowish-brown silt loam. The subsoil is about 39 inches thick and does not permit ready movement of moisture. The upper 14 inches of the subsoil is yellowish-brown silt loam and the lower 25 inches is a very firm, yellowish-brown, silty clay loam and sandy clay loam fragipan. The underlying material, to a depth of about 5 feet, is stratified fine sandy loam, loamy sand, or fine sand.

2.4 Geology

The Air Products facility is located on the Coastal Plain approximately 3 miles southeast of the Fall Line. The facility is situated on sediments which are identified as the Talbot Formation. This formation is made of deltaic and floodplain deposits consisting of lenses of micaceous sand and gravel interbedded with thin layers of silt and fine sand. This area of the Talbot Formation consists of course grained facies. These facies are fine grained sand and loam grading to coarse grained and gravelly at the base. Clasts of crystalline rock in gravel range in size to boulders 8 feet (2.5 m) across. The Talbot Formation is between 25 and 50 feet thick (Maryland Geological Survey, 1986).

The Pensauken Formation underlies the Talbot Formation. The Pliocene-aged Pensauken Formation consists of 15 to 150 feet of arkosic sand and loam underlain by gravel. The sand is commonly cross-bedded and was probably deposited by the ancestral Delaware River during late Tertiary time.

2.5 Surface Water and Hydrogeology

Elk Creek splits into two forks just south of Elkton. Air Products is situated between the two forks of Elk Creek, approximately 1/2 mile from the eastern fork (Big Elk Creek) and 1/3 mile from the western fork (Little Elk Creek). The Air Products RCRA Part A Application (November 6, 1980) states that the closest water body to the Air Products facility is a tributary to Big Elk Creek which is called "Ben's Gut" (**Figure 1**). Ben's Gut is located approximately 1/4 mile southeast of Air Products. Surface water from Air Products is believed to flow to Ben's Gut via a storm sewer pipe and/or open ditch. Ben's Gut discharges into Big Elk Creek, east of the facility. All surface water in the area drains into the Chesapeake Bay. Information provided by facility personnel suggest that the facility is not located on a flood plain (Air Products, February 15, 1989).

Very limited hydrogeologic information was available for this report. No wells are reported to be located at the facility or between the facility and Little Elk Creek or Big Elk Creek. The water table is estimated to be

10-20 feet below the ground surface. The general ground water flow is estimated to be in a southerly direction (USGS, 1985).

3.0 FACILITY DESCRIPTION

3.1 Site History

The site currently occupied by the Air Products facility has been used for industrial purposes since the 1800s. Before the Civil War a brick factory was present. During the Civil War, gun powder was produced on the site. No information was available concerning site activities between the end of the Civil War and the start of the Second World War. During the Second World War, an acetylene facility operated on site (Air Products, December 19, 1988).

No additional information was available regarding the locations of buildings, material handling, or operations at the site prior to 1954.

The present facility was built in 1954 by the Colten Chemical Company. The manufacturing process has remained essentially the same since 1954, although the ownership has changed several times. In 1958, AIRCO acquired the facility. Air Products and Chemicals, Inc. acquired the facility in 1971 and expanded the facility in both 1976 and 1981 (Air Products, December 19, 1988).

A map of the present facility is presented in **Figure 2**.

3.2 Manufacturing Process Description

Since 1954, the facility has manufactured polyvinyl acetate emulsions. The emulsions consist of approximately 50% water and 50% polyvinyl acetate with batch specific additives. The additives include surfactants and biocides. The emulsions are used by other companies to manufacture adhesives, paints, paper coatings, textiles, and non-woven products (Air Products, December 19, 1988).

Figure 2 - Facility Map

The polyvinyl acetate emulsions are manufactured in three production units in the facility. Two of these units operate in batch and one operates continuously. Two basic emulsions are produced which differ only in their percentage of butyl acrylate (Air Products, December 19, 1988).

The polyvinyl acetate emulsions are produced in a series of simple steps. Vinyl acetate monomer is pumped into a reactor and mixed with a second monomer, usually butyl acrylate. Dioctyl maleate is occasionally also used instead of butyl acrylate (Air Products, December 19, 1988).

An initiator is then added to the reactor. The initiator forms a free radical which cause a polymerization reaction to begin. Once the polymerization reaction has begun, it is self-sustaining as long as vinyl acetate is available for reaction. The reaction takes place at approximately atmospheric pressure and a slightly elevated temperature (Air Products, December 19, 1988).

The final production step involves pumping out the polyvinyl acetate and combining it with specific additives. The particular additives and the proportions in which the additives are added depends on the particular requirements of the customer (Air Products, December 19, 1988).

Raw materials, finished product, and other materials, including wastes, are stored in bulk at the facility. **Table 1** lists the contents, capacity, and the approximate age of the underground storage tanks present at the facility. The fill pipes and ground surface around all these tanks were inspected during the VSI. No spills or discolored soils were observed in the vicinity of the fill pipes. **Table 2** lists the contents of the above-ground storage tanks. The capacities of these tanks are listed in the Spill Prevention Control and Countermeasure Plan (Air Products, May 4, 1974, revised May 4, 1987) but plant personnel requested that this information be kept confidential. All of the above and below ground storage tanks are constructed of steel. The locations of these storage tanks are shown in **Figure 3**. A list of hazardous materials and the approximate quantities present is given in **Table 3**. A list of other materials present at the facility is given as **Table 4** (Air Products, May 4, 1987).

TABLE 1

UNDERGROUND STORAGE TANKS

	CONTENTS[1]		CAPACITY[2]	ESTIMATED AGE (years)[2]
1.	#2 Fuel Oil West	-	10,000 gallons	31
2.	Vinyl Acetate South	-	25,000 gallons	34
3.	Vinyl Acetate North	-	25,000 gallons	34
4.	Butyl Acrylate East	-	12,000 gallons	NA[3]
5.	Butyl Acrylate West	-	6,000 gallons	NA[3]
6.	Gasoline	-	275 gallons	25
7.	#2 Fuel Oil[4]	-	6,500 gallons	16[5]
8.	Gasoline[4]	-	55 gallons	27[5]

[1] Air Products and Chemicals, Inc. Spill Prevention Control and Countermeasure Plan, June 4, 1974, revised May 4, 1987.

[2] Air Products and Chemicals, Inc. UST Notification, May 6, 1986.

[3] The capacities of these tanks were not available. The integrity of one of these tanks was tested by Hunter Inc., August 10, 1987.

[4] These tanks were removed on November 16, 1986. An inspector from the Maryland Department of Natural Resources reported that the 6,500 gallon diesel fuel tank appeared in good condition. There were no signs of any perforations and the soil in the excavation did not appear contaminated. The 55-gallon gasoline tank was perforated. The removal of the gasoline tank is described in Section 3.4.

[5] Approximate age at time of removal.

TABLE 2

ABOVE-GROUND STORAGE TANKS[1]

Dike #1 Gross Capacity = (52'x38'x3') = 5,928 cu. ft.

1. Dioctyl Maleate
3. Caustic/Methanol Solution
3. Dioctyl Maleate
4. Caustic/Methanol Solution
5. Finished Product Storage
6. Finished Product Storage

Dike #2 Gross Capacity = (39'x14')+(17'x14') (1.6') = 1,254 cu. ft.

7. Igepal CO-630
8. Igepal CO-880
9. Pluronic F-68
10. Hot Dilution Water

Dike #3 Gross Capacity = (23'x13')+(16'x13') (1.8') = 912 cu. ft.

11. Iconol OP-10 Storage
13. Iconol OP-30 (70%) Storage

Dike #4 Gross Capacity = (42'x35'x3') = 4,410 cu. ft.

13. Finished Product Storage
14. Finished Product Storage
15. Finished Product Storage
16. Finished Product Storage
17. Finished Product Storage
18. Finished Product Storage

Dike #5 Gross Capacity = (58'x28'x1.3'avg.) = 2,111 cu. ft.

19. A Effluent Tank
20. C Effluent Tank
21. B Effluent Tank

Dike #6 Gross Capacity = (16'x11'x0.42') = 74 cu. ft.

23. #2 Fuel Oil (Rail Car Mover)
23. Waste Oil Storage
24. Gasoline Storage

[1] Air Products and Chemicals, Inc. Spill Prevention Control and Countermeasure Plan, June 4, 1974, revised May 4, 1987. The capacity of the dikes given here is approximate and may have changed.

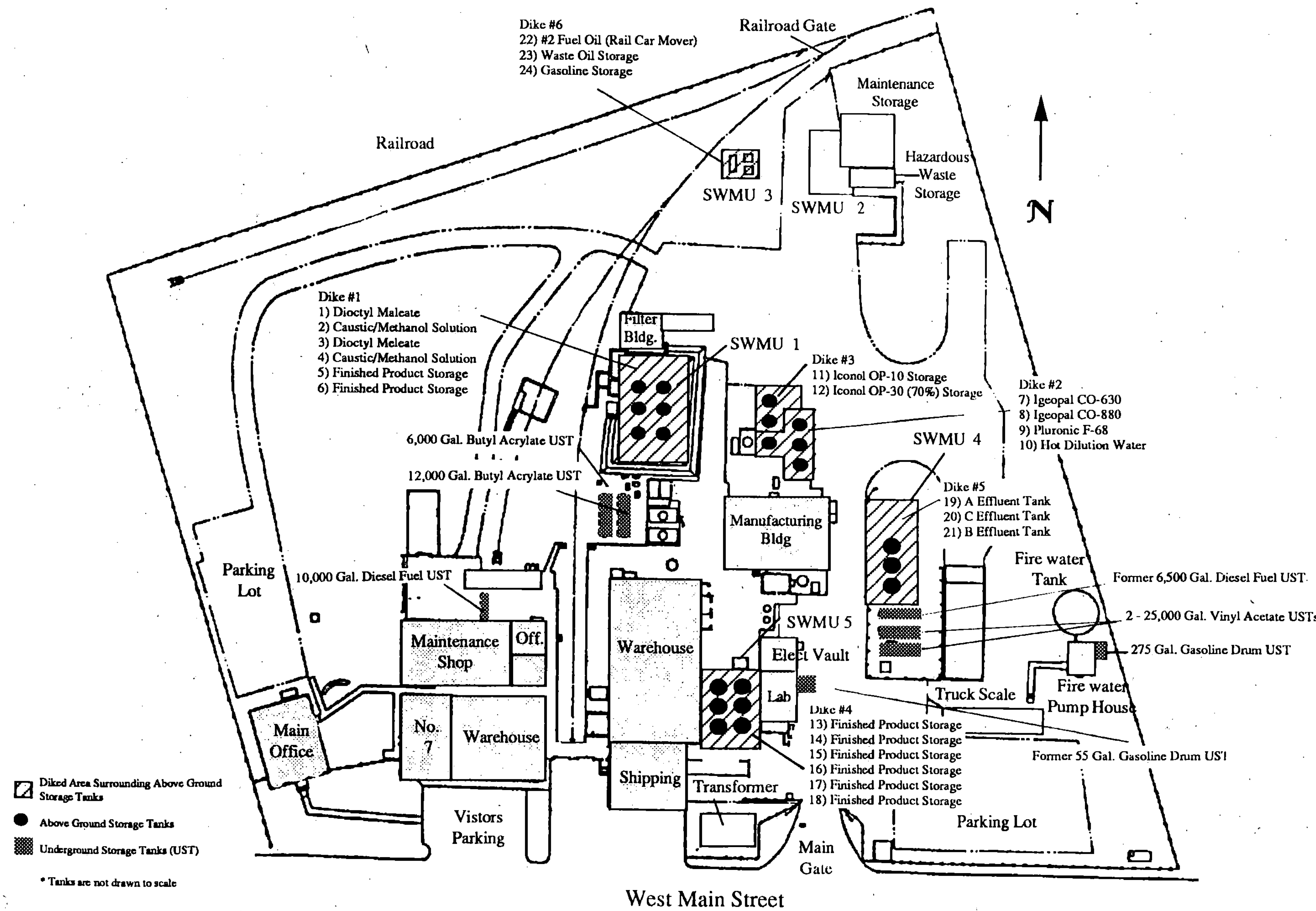

Figure 3: Location of all existing and former storage tanks at Air Products and Chemicals (modified from Air Products and Chemicals, October 1980)

TABLE 3

HAZARDOUS MATERIALS ON SITE[1]

Material	Maximum Quantity Stored at Plant (lbs.)
Acetic Acid	20
Ammonium Hydroxide (Aqua Ammonia)	7,000
EDTA (Versene 100)	3,500
Ferrous sulfate	300
Formaldehyde[2]	4,000
Hydrochloric Acid	20
Maleic Anhydride	5,000
Mercury	6
Pentachlorophenol (Mitrol GST)	500
Phosphoric Acid	400
Potassium Hydroxide	750
Sodium Hydroxide	40,000
Styrene (Alpha-Methyl)	20
Sulfuric Acid	20
Toluene	10
Vinyl Acetate	390,000

[1] Air Products and Chemicals, Inc. Spill Prevention Control and Countermeasure Plan, June 4, 1974, revised May 4, 1987.

[2] 37% solution

TABLE 4

OTHER MATERIALS ON SITE[1]

Acrylic Acid	Kathon LX
Alipal CO-433	Merbac 35
Brawn	Methanol
Butyl Acrylate	Pluronic L-64
Colloid 585	Pluronic F-68
Colloid 675 and 677	Surfynol 465 or 485
Dextrol OC-140	SVS
Dioctyl Maleate (DOM)	T-Butyl Hydroperoxide
Dispex N-40	Triton X-100
Ethylene glycol	Triton X-305
Giv Gard DXN	Versene 100
Hydrogen Peroxide	
Igepal CO-630	
Igepal CO-880	

1 Air Products and Chemicals, Inc. Spill Prevention Control and Countermeasure Plan, June 4, 1974, revised May 4, 1987.

3.3 Facility Waste Generation

Several wastes types are generated at the facility. These wastes are described below.

Caustic Methanol Cleaning Solution: The largest volume of wastes is a caustic methanol cleaning solution. Methanol is combined with caustic soda inside the production reactors. This solution is used to clean the reactors of the small amounts of product which adhere to the inside. After each use, the caustic methanol cleaning solution, which now contains some polyvinyl acetate product, is pumped into two storage tanks (Air Products, December 19, 1988). These tanks are identified on **Figure 3.**

The cleaning solution is reused until it does not effectively clean the reactors. At that time the spent waste cleaning solution is disposed of offsite. Approximately 20,000 gallons of this hazardous waste are generated annually. No analysis of this waste was available (Air Products, December 19, 1988).

Laboratory Wastes: A small volume of waste is generated by the onsite laboratory shown on **Figure 2.** Quality control checks of the final product are done in this laboratory. A small amount of waste (one to two 55-gallon drums per year) is generated by these quality control checks. These wastes consist of methanol with traces of butyl acrylate, dioctyl maleate, vinyl acetate, and sulfuric acid. However, an analysis of this waste was not available. These wastes are collected in a drum which is kept just outside the laboratory, as shown in **Figure 4.** When the drum is full, it is moved to the hazardous waste storage area (Air Products, December 19, 1988). This area is also shown in **Figure 4.**

Waste Oil: The facility also produces small amounts of waste oil from routine maintenance operations (Air Products, December 19, 1988). This waste oil is stored in a small tank at the northern end of the property, as shown in **Figures 3 and 4.** This waste is shipped out for recycling (Air Products, December 19, 1988).

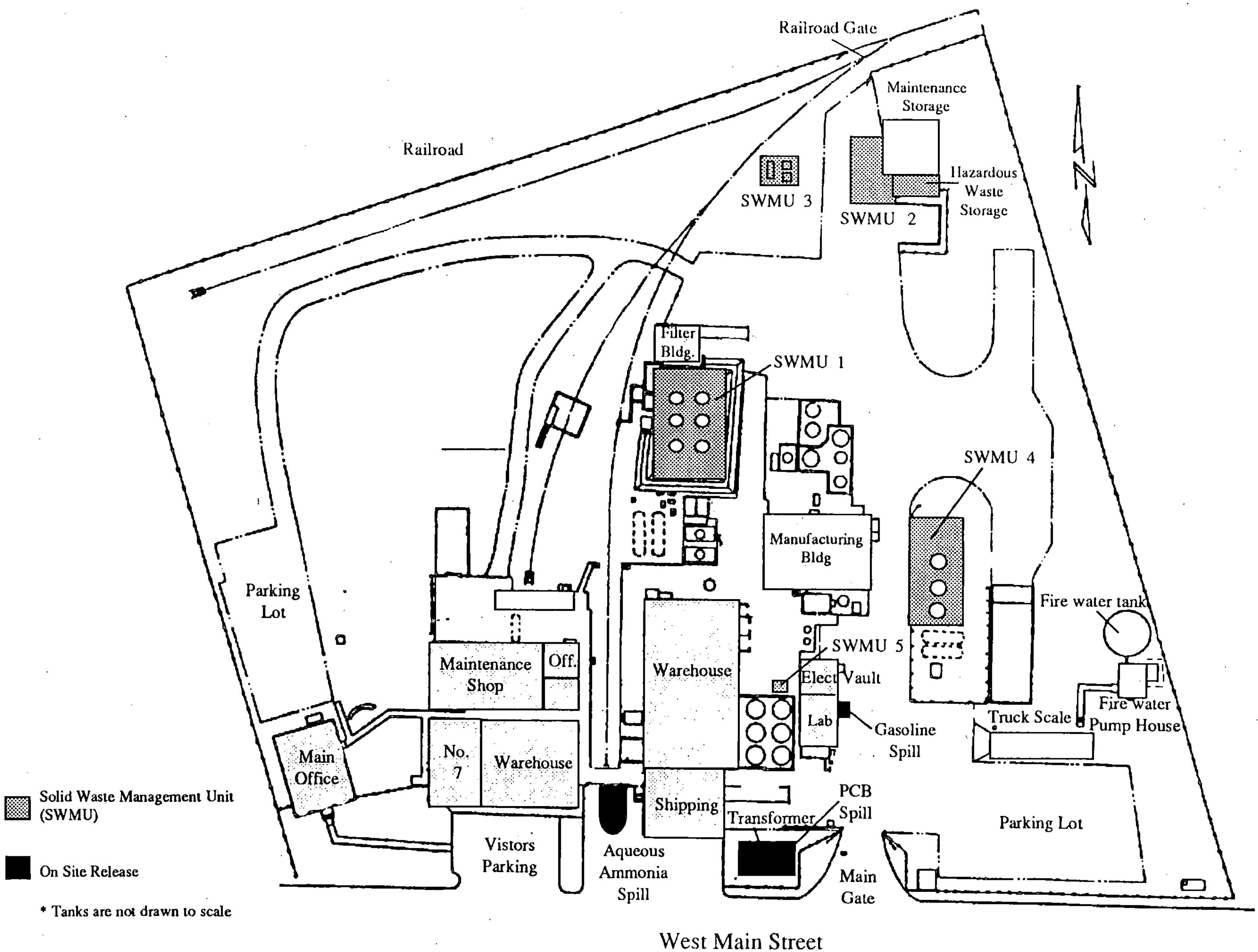

Figure 4: SWMU's, AOC's and On site releases (map modified from Air Products and Chemicals, October 1980)

Industrial Wastewaters: Several industrial wastewaters are generated at the facility. These wastewaters are collected and stored in the three effluent tanks shown in **Figure 3**. These wastewaters consist primarily of rinse water which contains finished product, traces of raw materials and additives, and other solids. Plant personnel report that these wastewaters are nonhazardous.

The floor drains at the plant receive rinse water from drums, tanks, and hoses. All floor drains discharge to the effluent tanks. Rinse water from the reactors is pumped directly to the effluent tanks. Approximately 6000 to 8000 gallons of wastewaters are typically generated daily.

Rainwater which collects in the dikes can be discharged either to the storm sewer or to the effluent tanks. Rainwater in the dikes is visually inspected before it is discharged. If plant personnel found that the water appeared to be contaminated (milky white), it would be discharged to the effluent tanks. However plant personnel could not recall any instances when water in the dikes appeared to be contaminated (Air Products and Chemicals, Inc.; telephone conversation between John van Hulle and Emily Duthinh; January 17, 1989).

The nonhazardous wastewaters in the effluent tanks are treated in the on-site wastewater treatment unit. The pH is adjusted and the solids are removed.

The treated water is discharged to the sanitary sewer and the solids, after dewatering, are shipped to a nonhazardous landfill. An analysis of the treated water and the solids is contained in **Appendix A** (Air Products, December 19, 1988 and January 17, 1989).

3.4 Previously Documented Releases

3.4.1 Off Site Releases

Wastewater Discharge: Records obtained from the Cecil County Health Department indicate that prior to 1979, the facility's nonhazardous wastewaters were discharged directly to both the storm sewer system and to the sanitary sewer system. These wastewaters were not analyzed but apparently contained finished product and smaller amounts of raw materials and additives. The Cecil County Health Department records from 1962 to 1979 document citizen complaints, problems in the municipal wastewater treatment plant, and pollution of two nearby surface bodies of water, Ben's Gut and Big Elk Creek. These problems resulted from Air Product's discharges to the storm and sanitary sewers. These records are contained in **Appendix B.**

In 1979, the facility began to use three above-ground storage tanks to collect these wastewaters for pH adjustment and controlled release to the storm and sanitary sewers. After July 1, 1988, Air Products began treating its wastewaters before discharging them to the sanitary sewers. Wastewaters are no longer discharged to the storm sewers (Air Products, December 19, 1988).

3.4.2 On Site Releases

PCB Transformer Leak: During a routine inspection on June 17, 1983, Air Products discovered that two of the four electrical transformers at the facility were leaking. The transformers are located on the southern end of the facility, next to Main Street, as shown on **Figure 4.** The transformer area is a secure, fenced area which houses four electrical transformers. The facility was shut down on June 22, 1983 so that Westinghouse could drain and service three of the transformers. After the transformers were refilled, the concrete pads which support the transformers were cleaned with 1,1,1-trichloroethane. Contaminated soil adjacent to the pads was removed to an approximate depth of six inches. Samples were taken of the soil in these cleaned areas and a background sample was collected. The results are included in **Appendix C** and indicate that all contaminated soil was removed. The dielectric oil, rags, and absorbent used in the clean-up and all of the removed soil were placed into labeled drums for disposal. The drums were shipped to an offsite hazardous waste disposal facility (Maryland Office of Environmental Programs, June 21, 1983). During the

VSI, there were no evidence of a spill, stressed vegetation, or discolored gravel or concrete in the transformer area.

Aqueous Ammonia Spill: On August 19, 1985, a four hundred pound drum containing a 29.3% aqueous solution of ammonia ruptured on the south loading dock. The location of the spill is shown on **Figure 4**. The spill was contained before it reached the storm drain located near the loading dock. None of the spilled material entered the storm drain. The spill was completely cleaned-up (Air Products, December 19, 1988). During the VSI, there were no evidence of a spill, stressed vegetation, or discolored soil or concrete in the area of the loading dock.

Abandoned Underground Gasoline Tank: On November 15, 1986, an abandoned underground gasoline storage tank was removed. This tank was located under the pavement immediately east of the electrical vault and just south of a concrete pad, as shown in **Figure 4**. This tank, a 55-gallon drum, still contained about twenty gallons of gasoline. The tank had a number of perforations, all above the level of the gasoline. The inspector for the Maryland Department of Natural Resources waived the requirement to install a monitoring well because:

- The tank had not been used since 1980 and had been emptied to the extent possible when it was abandoned.

- The gasoline found remaining in the tank was below the dip tube and the perforations which were above the liquid line were believed to have formed after the tank was taken out of service. (However, any gasoline which had been above the perforations would have rapidly leaked into the soil.)

- The surrounding soil was dug out and placed into drums. This action also removed the gasoline which had spilled during the drum's removal. Standing water in the hole after the removal did not have a sheen (Air Products, November 20, 1986). No soil or water samples were collected.

The matter was closed by the Maryland Water Resources Administration (Maryland Water Resources Administration, January 7, 1987). The inspection report from the State of Maryland and documentation from Air Products are included in **Appendix D.**

3.5 Regulatory History

Since November 19, 1980, the Elkton facility has operated as a hazardous waste management facility subject to the regulations promulgated under the Resource Conservation and Recovery Act. This facility qualified for interim status to store the caustic methanol cleaning solution in tanks and laboratory wastes in 55-gallon drums (USEPA, July 13, 1981).

On October 4, 1985, the State of Maryland requested that the facility file a Part B. On December 12, 1985, the facility notified the State of Maryland that Air Products would not file a Part B. The facility stated that its major hazardous waste, the caustic methanol cleaning solution, does not become a waste until it is spent. The spent waste would be removed within 90 days to a treatment facility. The other wastes which are stored, amounting to a few drums a year, would be managed by satellite accumulation, meeting the 90-day regulatory requirement (Air Products, December 12, 1985).

On December 16, 1987, the State of Maryland informed Air Products that the implementation of the the facility's closure plan had been accepted, terminating the facility's interim status (State of Maryland December 16, 1987).

The facility does not have a NPDES permit. No information could be obtained regarding any air permits.

4.0 SOLID WASTE MANAGEMENT UNITS

Five SWMUs were identified at the facility during the PR and the VSI. The location of each SWMU is shown on **Figure 4**. No additional areas of concern were identified at the facility.

4.1 Solid Waste Management Units

4.1.1 Unit No. 1 - Caustic Methanol Storage Unit (Photos No. 1a and 1b)

Description: SWMU No. 1 stores the caustic methanol cleaning solution used to clean the production reactors, as described in Section 3. The cleaning solution is stored in two large above-ground tanks within a dike. Because the dike is designed to contain any spills, the dike and its contents are considered as one SWMU. The dike is approximately 38 feet by 52 feet and contains six large steel above-ground storage tanks (Air Products and Chemicals, Inc. June 4, 1974, revised May 4, 1987). As shown on **Figures 3 and 4**, two of these tanks store finished product, two tanks store dioctyl maleate, and two tanks store the caustic methanol cleaning solution. The cleaning solution storage tanks have a reported capacity of 6,000 and 12,000 gallons respectively (Air Products and Chemicals, Inc., June 4, 1974, revised May 4, 1987). Photos 1a and 1b show the two storage tanks.

A new concrete dike surrounds the area on four sides. Previously, the area had been surrounded by an earthen dike. The area inside the dike is not paved and is covered with gravel. During the VSI, the gravel appeared to be clean. The dike has a capacity of approximately 110 percent of the capacity of the largest tank it contains. No spills have been reported from any of the tanks in this SWMU (Air Products, December 19, 1988).

The tanks and all piping to and from these tanks are above ground and appeared to be in excellent condition during the VSI.

Waste Characteristics: The waste stored in this area consists of methanol which has had caustic soda added to it. This solution is used to clean the polyvinyl acetate reactors; and therefore, also contains finished product and free monomer. This caustic methanol cleaning solution is an extremely viscous material at ambient temperature. Any material which penetrated the gravel to the soil would likely be confined to the top several inches of soil due to the viscosity of the cleaning solution. This contamination could easily be cleaned up (Air Products, December 19, 1988).

The cleaning solution becomes a waste when it no longer effectively cleans the reactors. It is then shipped out by tanker truck for treatment and disposal as a corrosive, flammable liquid n.o.s. U-N2924/RQ 100P, waste type D002. The most recent shipping manifest (November 23, 1988) is included in **Appendix E**. The laboratory wastes are added to the tanker containing caustic methanol cleaning solution.

Evidence of Releases: No known releases have occurred and no visible evidence of a release of the caustic methanol cleaning solution, polyvinyl acetate emulsion, or raw material (dioctyl maleate) was visible during the VSI. However, since the ground was covered with clean, fresh gravel, it was not possible to determine visually if a release had occurred.

4.1.2 <u>**Unit No. 2 - Concrete Storage Pad**</u> (Photos No. 2a and 2b)

Description: SWMU No. 2 consists of a concrete pad which is used to store the drums of laboratory waste. This area is illustrated in Photo 2a. The concrete pad is approximately 5 feet by 10 feet and is inside a dike. The concrete dike is approximately 4 inches high and appears in good condition. A storm drain is located in the corner of the SWMU; this drains to the wastewater treatment unit (SWMU No. 4). The drums are currently stored for a maximum of 90 days on the pad. No drums of laboratory waste were present in SWMU No. 2 during the VSI (Air Products, December 19, 1988).

The adjacent storeroom is approximately 10 feet by 15 feet. It is used to store empty drums of chemical additives (surfactants and biocides). Additional empty drums are stored on a concrete pad adjacent to the storeroom. This concrete pad is illustrated in Photo 2b. None of these drums contained hazardous waste. The drums are disposed of by crushing and shipping them to a nonhazardous landfill (Air Products, December 19, 1988).

Waste Characteristics: The laboratory waste stored on the concrete pad consists of methanol and traces of butyl acrylate, diocty maleate, vinyl acetate, and sulfuric acid. The waste is flammable (Air Products and Chemicals, Inc., June 4, 1974, revised May 4, 1987). The laboratory wastes are added to the tanker containing the caustic methanol solution and shipped offsite for disposal (Air Products, December 19, 1988).

The empty drums of chemical additives once contained nonhazardous biocides and surfactants. Material Safety Data Sheets for the primary raw materials are found in **Appendix F**.

Evidence of Releases: No known releases have occurred nor was any evidence of a release visible during the VSI.

4.1.3 Unit No. 3 - Waste Oil Storage Area (Photos No. 3a and 3b)

Description: SWMU No. 3 is a small, unsheltered, diked concrete pad which contains three above-ground storage tanks. The diked area is approximately 11 feet by 16 feet. The concrete dike is 4 inches high and appeared to be in good condition. One of the tanks stores waste oil and hydraulic fluid generated during routine maintenance of facility equipment. This waste is shipped out for recycling. The second tank stores gasoline and the third tank stores diesel fuel which is use to run the rail car mover (Air Products, December 19, 1988). Photo 3a illustrates this area.

Waste Characteristics: The waste consists of waste machine lubricating oil and hydraulic fluid (Air Products, December 19, 1988). No analytical data for the waste oil was available.

Evidence of Releases: During the VSI, a small (approximately 2 by 5 feet), dark, oily looking stain was observed on the ground just outside of the dike's west side. Photo 3b illustrates the discolored area. The discolored soil was adjacent to a pump used to empty the diesel tank. The facility reported that this spill occurred when the trackmobile, a vehicle used to move the railroad cars on the facility's property, was being refueled from the diesel tank. The facility reported that all of the discolored soil was cleaned up immediately after the VSI. Eight pounds of soil and gravel were removed and all contamination was contained within approximately the top inch of soil (Air Products, January 17, 1989). No evidence of leaking tanks or other evidence of a release were observed.

4.1.4 Unit No. 4 - Wastewater Treatment Unit (Photos No. 4a and 4b)

Description: SWMU No. 4 is an area which includes three effluent tanks and a building which contains the wastewater treatment unit. Photos 4a and 4b illustrate the three effluent tanks. Plant personnel declared that the capacity of above-ground tanks at the facility was confidential information. All of the industrial wastewaters generated by the facility, as described in Section 3.3, are collected and stored in the effluent tanks which are shown in **Figure 3.** This wastewater is pumped into smaller tanks within the building and treated by pH adjustment and solids removal. The solids are dewatered by a filter press inside the building and shipped to a sanitary landfill for disposal. The treated water is discharged to the sanitary sewer system.

Waste Characteristics: The treatment of the industrial wastewaters produces two waste streams, both of which are reported to be nonhazardous (Air Products, December 19, 1988). The first waste stream is the treated wastewater. The second waste stream is the solids generated when the wastewaters are treated. The solids consist primarily of polyvinyl acetate emulsion and small amounts of raw materials and additives. Analyses of both the treated wastewater and the solids are included in **Appendix A.** A sample of the solids which was analyzed on July 20, 1988 detected 21 ppb chloroform, 110 ppb ethylbenzene, 570 ppb xylene, 190 ppb acetone, and 140 ppb carbon disulfide. No pesticides or base neutral extractable compounds were detected.

Evidence of Releases: The area around this SWMU was under construction at the time of the VSI. The VSI was confined to walking around the outside of the building and the dike enclosing the three effluent storage tanks. No evidence of a release was observed.

4.1.5 Unit No. 5 - Laboratory Satellite Collection Area

Description: SWMU No. 5 is a paved area which is located just outside of the laboratory on the west side. An outer drum is used as an overpack for a smaller drum which is used to temporarily collect small amounts of laboratory wastes. No dike was present. However, the outer drum appeared in excellent condition.

Waste Characteristics: The wastes consist of methanol and traces of butyl acrylate, dioctyl maleate, vinyl acetate, and sulfuric acid.

Evidence of Releases: No visible evidence of a release was observed during the VSI.

5.0 POLLUTION MIGRATION PATHWAYS

5.1 Soil

There are several potential sources of soil contamination at the Air Products facility. These include the underground storage tanks whose integrity could not be visually inspected during the VSI. The potential sources of soil contamination are described below.

As noted in Section 4.1.3, a small (approximately 2 by 5 feet), dark, oily looking stain was observed on the ground during the VSI. This stain was located just outside of SWMU No. 3, on the west side of the dike and the above-ground tanks. The facility reported that all of the discolored soil was cleaned up immediately after the VSI. Eight pounds of soil and gravel were removed and all of the contamination was contained to within approximately the first inch of soil (Air Products, January 17, 1989). To avoid causing similar spills in the future, the facility intends to refuel the trackmobile on the tracks rather than adjacent to SWMU No. 3. If the discoloration was due to oil leaking from the trackmobile, there is a potential for minor future releases until the trackmobile is repaired.

The vinyl acetate, butyl acrylate, fuel oil, and gasoline underground storage tanks are additional potential sources of soil contamination. The integrity of one of the butyl acrylate tanks was tested by Hunter Inc. on August 10 and 11, 1987. The results of this test are in **Appendix G**, and indicated that the tank was "tight". None of the other tanks, which are 25 to 34 years old, have ever been integrity tested. The facility maintains that inventory controls indicate that the underground storage tanks are not leaking. However, small leaks may not be noticed by inventory controls. Because the tanks are underground, their condition could not be inspected during the VSI.

5.2 Ground Water

Ground water at the Air Products facility has been estimated to be within 10 to 20 feet of the surface. Any significant source of soil contamination could also impact the ground water.

Of the potential sources of soil contamination discussed, only the underground storage tanks may impact the ground water. If one or more of the underground storage tanks are leaking, ground water in the area immediately downgradient of the leaking tank(s) may be contaminated. Since no monitoring wells are present on the facility and no ground water samples have ever been taken, the present quality of the ground water under and downgradient of the facility is unknown.

5.3 Surface Water and Sediments

Prior to 1979, as described in Section 3, the facility discharged untreated industrial wastewater to Ben's Gut and to Big Elk Creek via the storm drain system or the municipal wastewater treatment plant. No water or sediment samples were ever taken from these areas.

Because all industrial wastewaters are presently treated prior to discharge to the Elkton sewage treatment plant, there does not appear to be any sources of contamination of the surface waters or sediments. According to information provided by facility personnel, the facility has not been flooded during the time Air Products and Chemicals, Inc. has owned the facility (Air Products, February 15, 1989).

5.4 Air

The polyvinyl acetate reactors are potential source of air contamination. These reactors operate at slightly elevated temperatures and pressures and vent small amounts of vinyl acetate to the atmosphere. An Organic Vapor Analyzer, which was operated continuously during the VSI, detected organic vapors in the warehouse, the laboratory, and above the reactors within the production buildings. No organic vapors were detected elsewhere at the facility. The current extent of air contamination is low.

5.5 Subsurface Gas

The potential for contamination of existing subsurface gas is principally from the underground storage tanks. Vinyl acetate, butyl acrylate, and gasoline stored in the underground storage tanks are volatile. Therefore, any release from the five underground storage tanks which store these compounds would impact the existing subsurface gas.

6.0 EXPOSURE POTENTIAL

6.1 Soil

Since the major potential sources of soil contamination are the underground storage tanks, any significant contamination of the soil at the facility is expected to be confined to the subsurface. The facility is fenced and access to the facility is restricted to the facility's employees. The only group at risk are these facility employees. Because no information is available on any contamination of the soil or integrity of the underground storage tanks, it is not possible to determine the exposure potential, but it is estimated to be low.

6.2 Ground Water

Since no ground water quality or underground storage tank integrity data are available, it is not possible to fully evaluate the exposure potential from ground water. However, the facility and the surrounding community receives its supply of drinking water from the municipal water supply. The municipal water system obtains its water from Elk Creek upstream of the town and Air Products. Therefore, any contaminated ground water would not be used for drinking water, but would eventually discharge to Elk Creek. Therefore, the exposure potential from the ground water is estimated to be low.

6.3 Surface Water and Sediment

The principal potential source of current contamination of surface water and sediments would be from any residual contamination from the discharged wastewaters to Ben's Gut and the Big Elk Creek via the storm and sanitary drain systems. The discharge of untreated wastewater by the facility ended in July 1988. Big Elk Creek is not used as a source of drinking water immediately downstream of these discharges. Without additional information, it is not possible to determine the exposure potential from the surface waters and sediments. However, the exposure potential from the surface waters and sediments is estimated to be low.

6.4 Air

As already discussed in Section 5, current releases to the air are very low. The only current exposure is to the facility's employees. The overall exposure potential from releases to the air from this facility is low.

6.5 Subsurface Gas

Unless there is a release from one of the underground storage tanks, there is no known potential for human exposure to contaminated subsurface gas at this facility.

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